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DIAGNOSIS OF YELLOW FEVER.

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When ordered by the Government to inspect points in the South as a yellow fever expert, I have assumed it to be my duty, not solely to report upon the diagnosis of individual cases, but to form an opinion as to the actual state of the outbreak, whether it be possible to localize it and stamp it out; or, on the other hand, whether the outbreak is beyond the control of our means of sanitation. I have even deemed it possible, when yellow fever was not found in one of the Southern States, to predict whether it was likely to break out or not during the summer. The diagnosis, then, from my point of view, is of two kinds, namely, as to the epidemic status of the locality, and as to the individual cases.

A careful study of the conditions existing in Cuba during the earlier part of the present summer made it very probable that yellow fever would extend from that island to this country. There probably has never been so much yellow fever in Cuba as there has been during the present season.

DETERMINATION OF EPIDEMIC STATUS.

First, as to the epidemic status: There are several features characteristic of the community where yellow fever is prevailing that make the fact known to an experienced observer, even when wilfully or otherwise its presence is denied by the physicians and local authorities. Without seeing a single case of the disease I have often made up my mind as to the existence of yellow fever from the reports of prevailing sickness given by the physicians.

In the first place, many cases of acute febrile attacks of mild character are reported and an attempt is made to show why they can not be cases of yellow fever. They are usually ascribed to an epidemic of dengue or to a prevailing malarial infection. The report that some of these cases have shown albumin in the urine becomes extremely suspicious. Fatal cases are reported, but some intercurrent disease or previously existing condition is supposed to be the cause of the fatal termination. On investigation it is found that most of these cases are of young people. Very often one or two physicians are found in a locality who positively declare that they have seen extremely suspicious cases or positively diagnosed such cases yellow fever. These physicians are generally younger members of the profession who have never seen the disease. It is a matter of experience that usually the older physicians acquainted with the disease in former epidemics fail to recognize these early cases and are the last to become convinced of the existence of the disease.

Convalescents from yellow fever may be discovered also on the streets. An icteroid hue of the eye persists usually for some time after recovery, and I believe not rarely shows itself also as a premonitory symptom of an attack.

Another aid toward forming an opinion is found in the study of the mortuary records. A comparison should be made between the present time and the preceding year. Sometimes this investigation is in itself enough to give strong presumptive evidence one way or the other. The characteristic feature of the mortuary records is the increase in the number of deaths among the white population. The class of the white population especially affected varies according to the manner of introduction of the disease. It may affect especially the sailors, or children, or railroad people. Even when there is no marked increase of the death rate of white people we may find causes of death that are suspicious. For instance, young adults dying of congestion of the stomach, congestion of the brain, purpura hemorrhagica, meningitis, Bright's disease, bilious remittent fevers.

DIAGNOSIS OF INDIVIDUAL CASES.

The diagnosis of individual cases of yellow fever is, in my opinion, very easy. There is no acute febrile disease in which there are as many signs that may be called pathognomonic. The diagnosis of the disease rests upon three such symptoms, namely, the facies, the albuminuria, and the want of correlation between the pulse and temperature. I rely mainly for my diagnosis upon the facies, which I consider extremely characteristic. However, as I consider it my duty to convince the local practitioners of the existence of the disease, I make it a rule not to announce officially the existence of yellow fever until I have been able to show the presence of albumin in the urine. My own mind, however, is generally made up by the simple inspection of the patient, and I almost invariably find my opinion confirmed on the second, third, or fourth day by the appearance of the albuminuria.

FACIAL APPEARANCES.

The appearance of the face is that of typhus fever during the first forty-eight hours of this disease or like that of measles before the eruption breaks out, with a more or less pronounced icteroid hue. It is the latter feature, I believe, which gives the face its characteristic appear-

ance. In the first twenty-four hours, or forty-eight, it is by no means a distinct jaundice. The physician to whom I am showing the signs of the disease usually expresses surprise when I state that jaundice is present. It is, of course, best noted in the sclerotics. It is hidden, however, by the marked injection of the smaller vessels. The icteroid hue is often better seen at some distance from the patient than when the eye is closely inspected. It seems to show itself in waves with the different movements of the eye. Possibly this is the result of transient contraction of the vessels of the conjunctiva or of the different angles of reflection of the light upon the eyeball. In severe cases and on the second and third day of the disease the jaundice becomes more prominent. It will show itself in distinct waves as the capillaries of the skin contract with the movements of the facial muscles or it may be brought out by taking up a fold of the skin between the fingers, when the contrast between the yellowish, anæmic skin and the surrounding congested areas will become well marked. Later on there may be well marked jaundice. By this time usually the florid color of the face has been replaced by a more dusky hue. In the later stages of the disease there are also characteristic features of the facies in grave cases. The mind is usually clear and there is a peculiar alertness and watchfulness that is not seen in other acute febrile diseases. The physicians who have not seen yellow fever for many years seem to have this peculiar phase of the later stages of yellow fever impressed upon their minds. This, however, is too late a diagnostic sign for my purposes, and besides, it does not appear in mild cases of disease.

ALBUMIN.

The albumin appears in the urine usually on the third or fourth day of the disease. It may be very transient albuminuria. In many mild cases the albumin is present only in the urine passed in the evening of the third or fourth day. In many cases it is only a trace, but even then by a careful centrifugation granular casts may be found in the urine. In severe cases the quantity of albumin may be very great and the different forms of casts characteristic of acute parenchymatous nephritis are found in abundance in the urine. Now there are many acute febrile diseases in which albumin may be found in the urine, but in none of them so constantly nor so early when in connection with such mild manifestation of the toxæmia. In all such diseases the albuminuria will be found at the end of the first week or during the second week, and as an evidence of persistent high temperature and intense toxæmia. Cases of yellow fever corresponding in intensity with these present at the same time such characteristic features that it is impossible to mistake them. The difficulty of diagnosis can only be met with in connection with mild cases.

PULSE AND TEMPERATURE.

The third characteristic symptom of this disease is the want of correlation between the pulse and the temperature. This may be a rather late manifestation and may be absent, especially in children. It should be remembered that the characteristic feature of yellow fever in this connection is not a slow pulse during the convalescence or even during the deservescence of the fever. The characteristic feature is that quite often we find that at the same time that the temperature may be rising

the pulse will be falling. On the third or the fourth day of the disease, for instance, with an evening exacerbation of half a degree or one degree of temperature, we may find that the pulse is perhaps 10 beats slower than in the morning. I have seen, however, the same discrepancy in cases of true dengue, and in the tropics also, in connection with other febrile diseases. Still this is exceptional. In dengue the excessive fall of the pulse presents itself with a distinct defervescence of the temperature, and I suspect that many cases that are reported from Cuba of slow pulse in typhoid and malarial fevers may have been cases of yellow fever.

USE OF THE MICROSCOPE.

An erroneous belief has prevailed throughout the South, especially among physicians who were not practical microscopists, that the microscope should be an important aid in the diagnosis of yellow fever. It appears that poorly prepared abstracts from the work of Sanarelli have led many to believe that a characteristic feature—the bacillus of Sanarelli itself—was found on examination of the blood. Now, the truth is, that even with the assistance of post-mortem examinations, Sanarelli was able to discover his bacillus in 56 per cent only of the cases of yellow fever. He would be a poor clinician, indeed, who could only diagnose about one-half of the cases. The truth is, however, that during life the microscope could not establish a positive diagnosis. As far as our present methods go, it would be impossible to distinguish between a drop of yellow-fever blood and blood from a healthy man.

Negative evidence may be presented by the microscope. The presence of the plasmodium malarie, for instance, would prove that a case was suffering with malarial poisoning, and, presumably, not with yellow fever. But the differential diagnosis between these two diseases is usually easy. The bilious remittent fever that in our old text-books of medicine occupied a conspicuous place in tables of differential diagnosis with yellow fever, has practically disappeared from the Southern sea border, since yellow fever ceased to be an endemic there. It was, in fact, the yellow fever of the natives, and of places in the interior. The former were supposed to possess a certain degree immunity against yellow fever, and the disease was believed to be restricted almost to the littoral.

The plasmodium has been found in the blood in cases of yellow fever. The mistake made by the board of experts of New Orleans, when they failed to recognize the existence of yellow fever at Ocean Springs, was due to the finding of the plasmodium in at least two of the cases.

DENGUE AND YELLOW FEVER.

The prevalence of a widespread, mild, epidemic fever during the present outbreak of yellow fever has been undoubtedly a source of doubts and difficulties in connection with the diagnosis.

Many of these cases were found to exist in houses where cases of yellow fever were present at the time, and I must confess that it was impossible to discover in them any of the characteristic symptoms of yellow fever. Many of these cases had a distinct eruption and must be looked upon as cases of dengue. This fact may bring forward new problems as to the relations between these two diseases. From our present point of view, we can only state that yellow fever appears to spread more easily when there is an epidemic of dengue prevailing. All

evidence goes to show that a previous attack of dengue does not protect against yellow fever, and we must look upon the former as an entirely distinct disease.

IMPORTANCE OF DIAGNOSIS OF FIRST CASE.

I can not insist too much upon the importance of the diagnosis of the first case of yellow fever in a locality. Undoubtedly the cause of the epidemic of yellow fever is to be found in the introduction into a community of cases that are not suspected to be yellow fever. This probably occurs most frequently in connection with individuals of the colored race. The disease in them is usually very mild, and their movements from place to place are less likely to attract the attention of the health authorities. I have no hesitation in saying that if the first case of yellow fever introduced into a city were always recognized the spreading of the disease would be invariably prevented.

I will conclude this report by inviting your attention to the fact that the movements of the yellow fever expert have been frequently interfered with by the fears of the communities that he might convey the disease from place to place. In moving from one locality to another I took all the necessary precautions and felt absolutely sure that I could not be a source of infection. I was immune and traveled with very little baggage, which I frequently changed. Yellow fever has never been carried from one locality to another in this manner.

This fear of the communities was in part genuine and due to ignorance, but was also in part a pretended fear of those who knew better. I have finally to state that I have received every attention and assistance from the local health authorities in all the cities that I have visited.

PHILADELPHIA, *October 28, 1897.*

[Temporary Acting Assistant Surgeon John Guit ras' report of his experience as yellow fever expert during the recent epidemic will appear in the next issue of the PUBLIC HEALTH REPORTS.]

Two cases of typhus fever in San Francisco.

PORT OF SAN FRANCISCO, CAL., *October 30, 1897.*

SIR: I have the honor to report two well-authenticated cases of typhus occurring in this city, as follows:

Edward Miller, white, aged 23 years, nativity, Devonshire, England, a resident of this city for some years past, employed as a shop hand at the Union Iron Works, a large shipbuilding concern, since April 30, 1897, was admitted at St. Luke's Hospital October 5, 1897. He gave a vague history of malaise for two weeks preceding his admission, but was incoherent and readily relapsed into stupor. The diagnosis was uncertain until October 10, 1897, when he was transferred in a private ambulance to the city and county hospital pesthouse, where, despite the efforts of one of the house staff and a special nurse, both of whose services were given exclusively to this patient, he died on October 17, 1897. The diagnosis of typhus was confirmed by necropsy and microscopic examination of the liver and spleen. This case was discussed in the newspapers at the time, but the preponderance of opinion expressed was that it was not typhus, but enteric fever. The health officer of this city urged cremation of the body, but this was opposed by the relatives, and it was buried in one of the city cemeteries in a hermetically sealed metallic case. I am informed by the Iron Works that Miller had been employed as a shop hand altogether since May 1 and had no occasion to go into any of the ships repairing at their plant.